COST-EFFECTIVE WORK SCHEDULES FOR SMALL-TOWN FIRE PROTECTION

FINANCIAL MANAGEMENT

BY: Harold J. Davis
Fort Scott Fire Department
Fort Scott, Kansas

An applied research project submitted to the National Fire Academy
as part of the Executive Fire Officer Program

February 2000

ABSTRACT

The problem is that the fire department has not clearly demonstrated how it should be organized and staffed to meet the service demands of our community in the most cost-efficient manner. The purpose of this applied research paper is to describe fire department staffing and work schedules and to identify potential changes that could be made to our organization that could improve productivity and service in the most cost-efficient method. The descriptive research method was utilized to answer the following questions:

1. What regulations and standards affect fire department organization and work schedules?
2. What work schedule is most used and what alternative work schedules are being used to improve service while maintaining or reducing personnel costs?
3. How are similar-sized paid or combination fire departments in Kansas organized and what are their work schedules and salary expenditures?
4. What factors or changes are appropriate for consideration in re-organizing work schedules to improve service while maintaining or reducing personnel costs?

A literature review and survey were conducted to describe regulations, industry standards, fire service opinions, Kansas fire departments' organization and work schedules, and personnel costs.

Results of the study revealed that the 24-hour shift was found to be the most popular type of fire department work schedule for suppression activities. However, alternative work schedules were found for both suppression and administrative activities. Factors that should be considered in any attempt to re-organize a fire department include federal regulations, national standards, length of duty shift, change in service, cost, use of alternative schedules for administration and suppression personnel, and safety.

Recommendations derived from the results of the study were to improve service by re-organizing the fire department. The re-organization included utilizing reserve personnel on weekend shifts and re-classify current captain positions to salaried administrative positions with flexible, alternative work schedules to improve staff functions and reduce overtime.

TABLE OF CONTENTS

INTRODUCTION

The City of Fort Scott is experiencing low cash reserves in the general fund. If a reduction of capital improvement expenditures does not correct the situation to the satisfaction of the city manager and city commission, then personnel costs will be looked at for additional expenditure reductions. The problem is that the fire department has not clearly demonstrated how it should be organized and staffed to meet the service demands of our community in the most cost-efficient manner. The purpose of this applied research paper is to describe fire department staffing and work schedules and to identify potential changes that could be made to our organization that could improve productivity and service in the most cost-efficient method. The descriptive research method was utilized to answer the following questions:

1. What regulations and standards affect fire department organization and work schedules?
2. What work schedule is most used and what alternative work schedules are being used to improve service while maintaining or reducing personnel costs?
3. How are similar-sized paid or combination fire departments in Kansas organized and what are their work schedules and salary expenditures?
4. What factors or changes are appropriate for consideration in re-organizing work schedules to improve productivity and service while maintaining or reducing personnel costs?

BACKGROUND AND SIGNIFICANCE

Fort Scott Fire Department has one fire station serving a population of approximately 9,000. Up until 1991, the fire department was staffed with one fire chief and 15 shift personnel divided into three shifts with a minimum of five personnel on duty at all times. In 1991, the department staffing was cut to 12 shift personnel divided into three shifts with a minimum of four personnel on duty at all times. Off-duty personnel receiving overtime compensation filled shift vacancies due to vacation or other leave.

Currently, the 12 full-time shift personnel are paid on a 14-day cycle receiving overtime pay for time worked in excess of 106 hours and callbacks. A fire reserve program consisting of eight personnel is in place utilizing part-time reserve fire fighters to fill shift vacancies. Full-time personnel are called in and paid overtime if no reserve is available. The department responds to structure fires with all four on-duty personnel in one fire apparatus. The fire chief normally works a 5-day 8:00-5:00 schedule and drives a staff vehicle on and off duty to respond to all structure fires when available. Other off-duty personnel and reserve personnel are called in via pagers to the fire station to respond with additional apparatus as deemed necessary by the incident commander.

In March of 1999, the city manager advised all city department directors that the city's general fund was experiencing lower than normal cash reserves.

In January 2000, all department directors, including the fire chief, were instructed to carefully monitor spending and to only purchase what is needed. A reduction in capital expenditures has been identified by city administration as the first step in replenishing cash reserves. City administration has also identified that the next step will be a reduction of personnel costs, should the capital expenditure reduction not meet their expectations.

Most of the fire department budget for capital expenditures is committed to making the ladder and pumper truck payments. Therefore, a reduction in fire department personnel costs is an action that could be taken to reduce overall spending.

In the fire department, staff functions such as inspections and code enforcement, training, communications, and maintenance have been assigned to the captains. Their primary responsibility, however, is to supervise the shift personnel. Although as much time as possible is devoted to the assigned areas, there is a definite lack of continuity and follow-up action in these areas. Adding staff personnel is clearly not a viable option at this time due to the low cash reserves in the city's general fund. There is also a growing concern by city staff about work schedules and the cost of personnel salaries in the fire department.

The problem is that the fire department has not clearly demonstrated how it should be organized and staffed to meet the service demands of our community in the most cost-efficient manner. The purpose of this applied research paper is to describe fire department staffing and work schedules and to identify potential changes that could be made to our organization that could improve service with the most cost-efficient method.

This applied research project relates to the planning chapter of the Financial Management course at the National Fire Academy by determining the most cost-efficient method of delivering our services.

LITERATURE REVIEW

Regulations and Standards

The Fair Labor Standard Act (FLSA) regulates wages and hours affecting fire departments. Grant and Hoover (1994) discuss the history and highlights of the FLSA that are of specific concern to the fire service. The initial version was passed in 1938 and has undergone several revisions. In 1966, amendments extended the coverage of FLSA to certain state and local government employees. This extension was challenged and upheld in the 1968 Supreme Court. In 1974, Congress expanded the FLSA to cover all state and local government employees, except for certain identified employees, such as fire fighters. This exclusion was challenged and in 1985 the Supreme Court ruled that FLSA was fully applicable to all state and local government employees. This became known as the Garcia decision.

Highlights of the FLSA affecting the fire service include compensation time, standard workweek, and work periods. Overtime compensation may be in the form of compensation time at time and one-half or overtime pay at one and one-half times the standard hourly rate. A maximum of 480 hours of compensatory time may be accrued before a fire fighter must take the time off or receive monetary compensation.

The standard workweek for the fire service is defined as 53 hours. City governments are allowed to set the standard work period at 28 days to mitigate the impact of the legislation. This allows city governments to pay compensatory time or overtime for time worked over 212 hours in a 28-day work period instead of over 40 hours in a 7-day period. This arrangement helps to offset the controversy over paying fire fighters for sleeping.

A comparison of compensation over a 12-week period consisting of three 28-day cycles for a fire fighter working a 24/48-hour schedule with a 53-hour 28-day work period and a 40-

hour/week provision was conducted. It clearly shows that the 53-hour 28-day work period saves 156 hours of overtime over the study period. The fire fighter would have worked 672 hours in the study period of 12 weeks. Under the 40-hour system, the fire fighter would be entitled to 192 hours of overtime compared to 36 hours of overtime with the 53-hour 28-day period. The following table further illustrates this comparison.

	1st 28-day Work Period	2nd 28-day Work Period	3rd 28-day Work Period	Totals
Total Hours Worked	240	216	216	672
Overtime in standard 40-hour week	80	56	56	192
Overtime under FLSA 53-hour week	28	4	4	36
Overtime savings under 53-hour week	52	52	52	156

Grant and Hoover further discuss ways to reduce overtime. All FLSA overtime may be eliminated with increased staffing. However, the cost of fringe benefits for more employees usually negates any overtime savings. Mutual aid agreements can be used to supplement on-duty suppression forces. Smaller fire departments often use volunteer or paid-on-call firefighters to supplement full-time fire fighters. While career fire fighters may oppose a reduction in overtime, many departments may not be able to afford to continue paying overtime. Grant and Hoover state,

> The two most important issues in scheduling and cost management are providing optimal fire protection to the community and ensuring the safety of the fire fighters during

> emergency response situations. If this can only be accomplished through the use of part-paid personnel, then that program must be adopted (p. 84).

Grant and Hoover further emphasize that with the increasing financial restrictions on local communities and fire departments, the use of innovative scheduling and paid-on-call personnel will be required.

The National Fire Protection Association (NFPA) standard for developing fire protection services for the public addresses the organizational structure of the fire department. The appendix of NFPA 1201 states that a small fire department organization includes a fire chief, assistant fire chief, suppression division, training division, fire prevention division, and safety division (NFPA 1201, 1994). It also emphasizes the importance of having a list of responsibilities for each position. For smaller departments, one officer may be responsible for more than one function such as training, safety, and maintenance. NFPA 1201 states that each company shall be led by an officer in any fire fighting activities, who is considered part of the total personnel of the company. Chief officers shall be available to command the fire companies at each emergency scene. The appendix further clarifies that the functions of chief officers below the rank of fire chief may be combined. In small one or two company departments, a ranking company officer could be designated second in command. The objective is to provide a chief or ranking officer at each fire or other emergency in a reasonable amount of time.

Work Schedules

Cote and Linville (1991) report that staffing levels of major metropolitan cities in the U.S. range from one to three per thousand population with an average of 1.5 per thousand. Another study of 25 fire departments working a 42-hour week showed a median of three fire fighters per thousand population. Smaller departments may have a relatively higher staffing ratio

because of the need for a sufficient number of on-duty personnel for initial attack and rescue operations.

According to Cote and Linville, the average workweek for career fire fighters is 40 to 56 hours. Most departments working an average of 50 or more hours per week use the 24-hour duty shift. Departments working 48 or less hours per week have day and night shifts, the most popular being a 10-hour day and 14-hour night shift. Some administrators who are not knowledgeable about fire department operations have suggested an 8-hour day, 40-hour week for fire fighters, similar to police schedules. This has proven impractical and undesirable. The 8-hour shift is usually proposed as a bargaining chip by administrators to counter employee demands for better compensation. Most municipal fire departments have not seriously considered 8-hour work shifts when given the choice between 24-hour shifts and increasing staffing by 40 percent to accommodate the 8-hour shifts. Many small fire departments must rely heavily on off-duty response on an overtime basis. Usually, a minimum of two and often four hours of overtime pay is paid for each response. It may be more economical for a small department with few structure fires to pay for overtime response than to provide full on-duty staffing around the clock. Many small communities employ fire fighters paid by the hour or by the incident for response to alarms and drills. These are not volunteers according to FLSA rules and are subject to the federal wage and hour regulations.

Mutual aid is a very important tool for providing additional resources. Almost all jurisdictions rely on some type of mutual aid and some departments use automatic mutual aid on the initial response.

Coleman and Granito (1988) state that a reduction in work hours may generate some compensation from overtime funds. However, a corresponding increase in the number of

personnel will be necessary to maintain group sizes or numbers. This result only produces a point of diminishing return very rapidly. Without a reduction in service level, new positions will be needed to compensate for hour reductions for line or staff personnel.

As the average workweek increases, hourly wages will drop. Additionally, the more hours per week a fire fighter is on duty, the more financially efficient the cost of providing fire protection is likely to be for the employer (Fire Service Labor Monthly, 1995).

Mims (1999) concludes that 12-hour shifts can reduce overtime cost as compared to 24-hour shifts. She cites that hiring personnel back to cover leave time for 10, 12, or 14-hour shifts is less expensive than hiring a person back for 24 hours. She also recommends a 10/14 shift over a 12-hour shift because it is the most popular alternative to the 24-hour shift and there is an increase in safety, due to less fatigue.

Hill (1997) reports that although there is interest in alternative schedules in the fire service, their use is not common. His research found that 92.5 percent of surveyed career departments use 24-hour shifts. He reports that cost is a factor against moving from 24-hour shifts to shorter length shifts. Productivity would have to be increased greatly to offset additional payroll or reduced staffing associated with a shorter workweek. He reports that several departments have tried 8-hour shifts, but have reverted back to 24-hour shifts. Hill recommends consideration of peak load staffing because call volume is higher during the day when fire fighters perform training, maintenance, and inspections; and lower during the night when fire fighters are sleeping.

Frazier (1999), citing a recent study, states, “The IAFF determined that the cost associated in reducing overtime hours from 56-hours per week to 53-hours was 3% more than the cost to pay for the additional overtime” (p.31). Frazier reports that the perception of a lack of

productivity associated with the 24-hour shift continues to be a concern by leaders when evaluating shift schedules. He states that his research was inconclusive as to whether or not a significant increase in productivity would result from the use of alternative schedules. He reports that little additional productivity was observed after 10:00 PM with a 10/14 schedule or an 8-hour shift, except it allowed for inspections of bars and clubs.

Frazier found that 67.65 percent of surveyed fire departments utilize some form of the 24-hour shift. He also reports that several departments use a 10/14 or 12-hour schedule; but the majority of those departments provide EMS transport service.

Frazier states that, according to a recent IAFF study, the 42-hour workweek is the most prominent schedule in the United States replacing the 56-hour week.

A study conducted on EMS workers concluded that a change from 24 to 12-hour shifts appeared to produce greater satisfaction with work schedules, reduced social/family disruption, and decreased feelings of exhaustion/burnout (Boudreaux, Mandry, Brantley, and Jeffries, 1997). It was noted, however, that the reason the change was initiated was because the number of calls had consistently increased to the point that working for such a prolonged period of time under high-demand conditions became unmanageable.

Rule (1997) proposes a 10-hour day/14-hour night schedule to make the fire department more effective and productive. He cites advantages such as sick leave reduction, overtime reduction, safety, family contact, project management continuity, increased productivity, and easier shift scheduling. Sick leave and overtime reductions are based on absences of 10 or 14 hours instead of 24. He states that family contact is increased because every evening meal may be spent with family. There is more continuity for project management with working three or four days in a row than with working day-on, day-off 24-hour shifts. Productivity can be

increased because some assignments such as training, code enforcement, and maintenance can be accomplished in the evening. With 24-hour shifts, most non-emergency assignments stop at 5:00 PM.

Rule admits that changing the work schedule will be met with resistance from fire fighters. However, he states that the fire service should adopt the work schedule that best serves the taxpaying public. Rule defends the 10/14 schedule because it retains the 56-hour workweek and no new personnel are needed to make the change. Rule says this schedule delivers more bang for the buck and it is time to take a serious look at this change.

Maurno (1996) reports from an informal poll of several Boston-area departments that every chief, captain, and fire fighter cited morale as the key benefit of the 24-hour shift. Another advantage is arriving at work rested, not exhausted by a second job or troubled by a domestic problem. The teamwork that is built by spending 24 hours together carries over to emergency scenes. Maurno says that fewer sick days are used with the 24-hour shift because by only working two days a week, the remaining five days are sufficient to handle personal issues. He states that the shorter workweek allows fire fighters flexibility to have second jobs and more family time. Fire fighters cited day trips with their spouses and the ability to provide day care or coach their children's sporting events as advantages of the 24-hour shift.

Maurno also discusses two disadvantages to the 24-hour shift; a high volume of calls can make a difficult 24 hours and extra duty time is paid at overtime rate.

Bramell (1997) reports on the Livermore Fire Department's innovative schedule for their division chiefs. They had been classified as battalion chiefs and had several staff functions assigned to them such as training and public education. However, there was little time dedicated to the staff functions because their primary function was to supervise suppression personnel.

With a lack of interaction between them and the fire chief coupled with ineffective department planning, a new schedule was implemented. A five-day work schedule allows them to work three 10-hour days with a 14-hour standby duty, two 8-hour days, and then have four days off respective with their regular shift. This results in 46 hours of office time and 42 hours of standby time per nine-day cycle (3,568 hours annually). Monthly staff meetings are now held and strategic plans and problem solving skills are being developed. The public demands that fire agencies become more productive and justify their existence. Fire department managers are forced to become more innovative, to do more with less.

In Austin, Texas, Paulsgrove (1992a) reports that shift positions are viewed as an advantage over a 40-hour staff workweek. Attempts to provide incentives to compete with shift assignments are a losing battle against a moving target. Four-day or flexible workweeks must be defended against charges of reduced productivity and attacks from other municipal agencies that covet the same benefit. A transfer or promotion from a shift position to a staff position can be a traumatic adjustment. Citing survey results, Paulsgrove reported the following list of dissatisfying aspects of 40-hour per week staff assignments; the schedule, inequity with field position benefits, lack of team affiliation with the department, nature of the work, and a lack of appreciation for their work.

In a related article, Paulsgrove (1992b) reported that a slight majority of 56 percent of surveyed chiefs said that they adhere to the traditional eight-hour day, 40-hour workweek for staff positions. The remaining chiefs use a 10-hour day or other variation. Seventy-two percent of the departments that use an alternative schedule for staff positions agreed that it is an effective tool for recruitment and retention. One of the problems that plague managers is explaining to

decision-makers why additional incentives or organizational restructuring may be necessary to attract and retain qualified personnel in staff positions.

Cobb (1999) reports on how his fire department expanded services and reduced overtime simultaneously. They restructured the department from three to four platoons. Three platoons continue to work a 24/48 schedule, while the fourth platoon (D-shift) works every Thursday, allowing the shift that would normally work that day to take the day off. This reduced the average workweek from 56 to 48 hours and cut scheduled overtime. Each shift also has three hours of scheduled training each week, yielding a 51-hour paycheck. The D-shift personnel also work during peak day periods as backup to the other shifts and to spearhead the life safety education program. They can still respond to emergencies but are not interrupted as frequently as when the regular duty shift tried to staff the public education programs. Along with services being expanded, overtime was reduced from 7-10 percent each pay period to .5-2.5 percent each period.

Bramell's article on Livermore's new staff schedule influenced this project because the problems that prompted the new schedule are very similar to some of the problems that prompted this research project; little time devoted to needed staff functions, lack of interaction between shift commanders and the fire chief, and ineffective planning. Cobb influenced this project because his fire department found a way to improve service and reduce costs by reorganization of personnel, a task the author hopes to achieve in his own department through this research project.

PROCEDURES

Research Methodology

The research for this project was descriptive in that a literature review and survey were conducted to describe regulations, industry standards, fire service opinions, and Kansas fire departments' organization and work schedules. Additionally, it was intended to identify potential changes that could be made at Fort Scott Fire Department to improve service while maintaining or reducing personnel costs.

The survey was conducted to determine organization and work schedules of similar-sized paid or combination fire departments in Kansas. A survey was faxed to 20 Kansas fire departments, with 12 returns, listed in the 1999 National Directory of Fire Chiefs that were identified as either paid or combination and had a listed population of 12,000 or less. Volunteer departments were not included because the intent was to survey departments that have fire personnel on duty 24 hours a day, similar to Fort Scott Fire Department. A copy of the survey form is included in Appendix A.

Assumptions and Limitations

For the survey, it was assumed that the 1999 National Directory of Fire Chiefs would be the best source to identify the paid and combination fire departments in the state. It was assumed that the directory was the most recently published and up-to-date available source. The survey was limited to Kansas fire departments because they would fall under the same state statutes and regulations as Fort Scott Fire Department pertaining to the administration of the department.

Definition of Terms

For the purpose of this research project, the following terms are defined as follows.

Shift. A tour of duty consisting of the period of time during which an employee is on duty for purposes of determining compensable hours.

Work Period. A regular period of work that is not less than seven nor more than 28 consecutive days.

RESULTS

1. What regulations and standards affect fire department organization and work schedules?

The only regulation found that affects the fire department is the FLSA. The most important aspect of this act is that it directs fire departments to pay overtime or compensatory time of one and one-half times for any time worked beyond 53 hours per week. A maximum of 480 hours of compensatory time may be accumulated before the fire fighter must be paid or take the time off.

There is a provision that allows the department to set the work period at 28 days. This reduces costs because cities are allowed to pay overtime for time worked over 212 hours in a 28-day period as compared to 40 hours in a seven-day period. The literature clearly shows huge cost savings to cities because of the 53-hour workweek and the 28-day work period. Because of FLSA regulations, a 12-week period results in savings of 156 hours of overtime per fire fighter (Grant and Hoover, 1994).

The only national standard reviewed was NFPA 1201 standard for developing fire protection services for the public. It states that a small fire department should have a fire chief and assistant chief along with other divisions or staff functions including suppression, training,

fire prevention, and safety (NFPA, 1994). A chief officer or designated ranking officer should be available at all times.

2. What work schedule is most used and what alternative work schedules are being used to improve service while maintaining or reducing personnel costs?

Hill (1997) found that 92.5 percent of surveyed fire departments are using a 24-hour shift schedule. Frazier (1999) found that 67.65 of his surveyed fire departments are using a 24-hour shift schedule. Frazier cited the IAFF study that determined the cost of reducing hours from 56 to 53 per week to reduce overtime was 3 percent more than the cost of the overtime itself. Maurno (1996) cited poll results that showed morale is the key benefit to the 24-hour shift. He says fewer sick days are used and teamwork, flexibility for second jobs, and family time are increased.

Although mentioned periodically in the literature, the 8-hour day 40-hour workweek is seldom found as a viable alternative to the 24-hour shift. Only unknowing administrators have suggested its use to counter employee proposals in the bargaining process (Cote and Linville, 1991). The cost of increasing staffing 40 percent to accommodate 8-hour shifts is impractical. Hill (1997) found that some fire departments had tried the 8-hour shifts and had since reverted back to the 24-hour shift.

The 10-hour day 14-hour night schedule has support from some fire service officials. Mims (1999) favors it because of its potential to reduce overtime costs for leave coverage and less fatigue. Frazier (1999) found that some departments are using a 10/14 schedule, but the majority of them that do provide EMS transport service. Rule (1997) supports a 10/14 schedule because he says that sick leave and overtime will be reduced while productivity, safety, and family contact will be increased. He explains that there is more continuity with this schedule for

project management and the evening hours can be used for training, maintenance, and code enforcement.

In the Livermore Fire Department, the division chiefs are using an alternative schedule because they have both line and staff responsibilities (Bramell, 1997). They work three 10-hour days with 14 hours of standby duty at night, then two 8-hour days, then four days off. This allows them time to work on their staff functional duties in addition to their line supervisory duties. Other advantages include monthly staff meetings and better interaction with the fire chief.

For staff positions, Paulsgrove (1992b) reported that 72 percent of surveyed fire departments that use an alternative schedule agreed that it is a necessary tool for recruitment and retention. In another article, Paulsgrove (1992a) reported reasons for dissatisfaction with 40-hour staff assignments included the schedule itself and inequity with field benefits.

Another approach to reducing overtime and improving service was with the addition of a fourth shift (Cobb, 1999). The fourth shift (D-shift) works every Thursday and during daytime peak loads. On Thursdays, the regularly scheduled shift is given the day off, resulting in a substantial decrease in overtime. The D-shift leads the life safety education program while they are working the peak load time. They are also available to back up the regularly scheduled shift.

3. How are similar-sized paid or combination fire departments in Kansas organized and what are their work schedules and salary expenditures?

A survey was faxed to 20 Kansas fire departments, with 12 returns, listed in the 1999 National Directory of Fire Chiefs that were identified as either paid or combination and had a listed population of 12,000 or less. Out of the 20 surveys sent out, 12 were returned for a 60 percent return ratio.

Of the 20 returns, five were from fully paid departments and seven were from combination departments. The median population representing the 12 returned surveys is 9,850; very similar to Fort Scott's listed population of 9,000.

All of the 12 respondents provide rescue and fire inspections or code enforcement services. Eight (67%) provide EMS first responder service, six (50%) provide building code enforcement service, and two (17%) provide EMS transport service.

The median number of line personnel listed was 15.5. All stated they have three shifts except for one respondent stated they have one shift. The median for minimum number of on-duty personnel was 4.5 personnel. Seven (58%) departments pay overtime on a 14-day work period, four departments pay on a 28-day work period, and one department pays on a 21-day work period.

All departments except one (92%) reported they have a full-time fire chief position. All work some type of daytime schedule ranging from 40 to 44 hours per week. One-fourth of the departments has an assistant chief working an 8-5 schedule. One-third of the departments has a chief officer, battalion or assistant, on a 24-hour type schedule. Seven (58%) departments have at least one chief officer in addition to the fire chief. Nine (75%) departments have additional chief officers or a designated fire inspector. Four (25%) departments have chief officers on shift and five (42%) have captains or lieutenants listed as the ranking officer on shift. Of those five, two (40%) have an administrative assistant chief.

Eleven departments indicated they have on-duty personnel around the clock and all use some type of 24-hour shift schedule. Four (33%) departments use a 24-on/24-off/24-on/24-off/24-on/96-off schedule, five (42%) departments use a 24-on/48-off schedule, one (8%)

department uses a 24-on/24-off/24-on/48-off/24-on/24-off/24-on/96-off schedule, and one department did not list the type of schedule used.

Four (33%) departments have an administrative assistant and two (16%) departments have a building inspector.

The total number of full-time positions including line and staff personnel range from 1 to 21, with the median being 16.5.

Out of the seven combination departments, the total number of reserves, volunteers, or paid-on-call personnel range from 12 to 22, with the median being 17.

Ten responses were received for full-time salaries paid out in 1999. They ranged from $25,239.00 to $602,200.00, with a median of $281,035.00. Six responses were received for part-time salaries paid out in 1999. They ranged from $5,000.00 to $24,500.00, with a median of $14,927.50. Five responses were received for overtime salaries paid out. They ranged from $7,781.00 to $111,706.00, with a median of $20,237.50. Total salaries paid out including all three of the above categories ranged from $41,782.00 to $665,538.00, with a median of $306,688.50.

Ten departments answered both sides of the salary question, asking what amounts were budgeted and what amounts were actually spent. A percentage was calculated for the amount spent as compared to the amount budgeted for the sum of all three types of salary expenditures. Percentages of salary budgets spent ranged from 51 percent to 105 percent, with a median of 99.5 percent.

4. What factors or changes are appropriate for consideration in re-organizing work schedules to improve productivity and service while maintaining or reducing personnel costs?

The first factor considered is FLSA regulations. Our employees are covered under FLSA rules and they must be followed. The 53-hour workweek is an advantage to the fire service as compared to a 40-hour workweek and should be used to control overtime costs. Consideration should be given to reducing the three hours of scheduled overtime that is inherent with the 56-hour workweek. However, Frazier (1999) noted a study that concludes it costs more to reduce the workweek to 53 hours than it does to pay the scheduled overtime.

The second factor for consideration is that the national standard for organizing a fire department specifically shows that a small fire department should be staffed with an assistant chief and a chief officer should be available at all times. The survey found that 75 percent of similar sized communities have, in addition to the fire chief, more chief officers or a designated fire inspector.

The third factor for consideration is a comparison of shift lengths. The literature review and survey both support that the 24-hour shift is by far the most used in the fire service. There are differing opinions about if it is the most cost-effective or not. Some argue that the 10/14 shift reduces sick leave usage because only 10 or 14 hours are needed for a sick day instead of 24 hours (Mims, 1999). Rule also believes sick leave is reduced with this type of schedule (Rule, 1997). However, Maurno (1996) states that fewer sick days are used with the 24-hour shift because there are only two working days per week. Frazier reported that the majority of 10/14 shift schedules he found were associated with departments that provide EMS transport service, thus having a higher call volume. Another study of EMS workers supported the idea that a shorter shift, in this case 12 hours, was better for EMS transport providers due to the high number of calls (Boudreaux, 1997). Productivity associated with different shifts should be considered also. Rule (1997) says that productivity will increase with a 10/14 shift while Frazier

(1999) reports that his research was inconclusive about increased productivity with a 10/14 shift. Some type of schedule using the 24-hour shift should be considered. The 8-hour shift should not be considered due to the high cost associated with the necessary increase in staffing.

The fourth factor that should be considered is a change in service that would accompany any re-organization. Service levels should not decrease and if at all possible should increase to justify the change. Extensive support is found in the literature review and in the survey for providing a strong fire prevention program as part of a modern fire protection service. Our level of service is relatively low in prevention activities such as routine inspections, plan reviews, and public education programs. Communication between officers, continuity and completion of staff functions, and accountability for functional areas should be improved with any organizational changes.

The fifth factor for consideration is cost. With the current shortage of cash reserves, any changes must not cause an increase in overall budget expenditures and should, if at all possible, cause a decrease. According to the survey of similar-sized communities, the median cost for total salary expenditures is $306,688.50. Our total cost for salary expenditures is $421,000.00. Any changes should not cause an increase to salary expenditures, but shift a portion of them to prevention and other administrative functions.

A sixth factor for consideration is the use of alternative scheduling for some supervisory positions. As Livermore Fire Department chose, division chiefs use them to fill both line and staff responsibilities (Bramell, 1997). These positions also called for the chiefs to be put on standby time to respond to major incidents. Alternative scheduling will be needed to encourage recruitment and retention for staff assignments (Paulsgrove, 1992b).

A seventh factor is the consideration of adding a fourth shift to reduce overtime and increase prevention activities such as public education as was done in Lanett, Alabama (Cobb, 1999).

The final factor for consideration before any organizational or scheduling changes are made is safety. On-duty staff should not be reduced and should be increased, if possible. This may be done with more utilization of the reserve force and standby time for chief officers. The median number of shift personnel found by the survey for similar sized communities is 15.5. Our department is more than 20 percent less than the median. The number of reserves should be increased to reflect the median of 17, found by the survey. This number included volunteers, reserves, and paid-on-call positions.

DISCUSSION

In the survey results, all departments used some type of 24-hour schedule for shift personnel. This is comparable to the literature review that also showed the majority of other surveyed departments use a 24-hour shift schedule (Frazier, 1999). No 10/14 type schedules were listed in the survey results, but there was considerable support for them in the literature review. Mims (1999) favored them over the 12-hour schedule and the 24-hour schedule. Rule (1997) cited several advantages of the 10/14 schedule with reduced costs being the main advantage. The majority of surveyed departments are following NFPA standards regarding using an assistant chief or other chief officers to share some of the administrative functions of the department (NFPA, 1994).

The author's interpretation of the study results is that Fort Scott Fire Department operates with less than the median number of total shift personnel found by the survey to be 15.5. Our department has 12 shift personnel, eight reserve personnel, and one fire chief. We also have considerably less reserve personnel than the survey median of 17 (includes reserves, volunteers, and paid-on-call). Along with these shortages of personnel, our department is clearly understaffed in chief officer or administrative positions. The survey results found that 75 percent of responding departments have additional chief officer positions or a fire inspector position. Our department has neither. The workload of general administration, personnel management, inspections and code enforcement, training, maintenance, and safety is too much for one administrative person to effectively manage. Inspections and code enforcement should have at least one full-time position. As most fire service professionals, the author realizes the importance of fire prevention activities but admits our department is severely lacking in performing these services due to a lack of administrative staff personnel.

Further interpretation of the study results indicates that although our department has fewer staff than the survey median, we have 37 percent higher salary expenditures. Our 1999 total salary expenditures are $421,000.00 as compared to the survey median of $306,688.50.

The implication of the results for the organization is that there is an obvious need to re-organize our department and change some work schedules. In short, Fort Scott Fire Department spends more money for fewer personnel, with no administrative staff personnel other than the fire chief, and is lacking in continuity and completion of staff functions.

RECOMMENDATIONS

A shift of personnel costs needs to be made from overtime to administrative staff functions. Overtime costs have already been reduced by $16,000.00 from 1998 to 1999 by using reserves to work vacancies as much as possible (City of Fort Scott, 1999). An estimated additional $8,000.00 will be saved by using administrative support officers to fill vacancies not covered by reserves with each support officer working one 24-hour shift per month. A reserve will be scheduled to work each Saturday and Sunday. This will cost approximately $13,000.00 per year, yielding an $11,000.00 annual savings. A general plan for re-organization is presented that will fulfill the purpose of this research project. However, continuous adjustments will be necessary to accommodate unforeseen issues that will become apparent after implementation.

Lieutenants will supervise their respective shifts and the three captain positions will be eliminated. Designate one of the three captain positions as second in command and re-classify as an assistant chief position with specific staff functions, primarily training and safety. Re-classify the other two captain positions as administrative support officers with specific staff functions; primarily fire prevention, code enforcement, maintenance, and communications. All three of these new positions will be classified as FLSA-exempt salaried positions.

Use a rotating schedule for the fire chief and assistant chief, providing a chief officer either on duty or available at all times. Each would work a 10-hour on/14-hour standby duty day for five days and then have three days off. The first and last day of each 5-day cycle overlaps with the other chief's schedule. This allows them to work together every fourth day for improved communications and continuity, and provides for flexibility in granting compensatory time off while maintaining a chief officer on duty. During the standby time, the chief officer must stay within the normal residential policy of within five miles of the city and respond

directly to any structure fire or other major emergency and be available to the on-duty company officer for assistance with any other issues.

The two administrative support officers will normally work a four-day workweek consisting of four 10-hour on/14-hour standby days, rotating between Monday through Thursday and Tuesday through Friday every other week. The other difference in their schedule is that they will occasionally fill in on a 24-hour shift when there is a vacancy and no reserve is available to work. They will be given compensation time off in lieu of paying overtime wages.

Every fourth Wednesday, all four administrative officers will be on duty with this schedule. These Wednesdays are the designated as the planning and meeting day. This will alleviate one of the current problems of captains having to report in for meetings on their day off. It will also eliminate the overtime that was required for those meetings.

The chief officers will be provided a vehicle to respond to incidents at any time that they are available. The fire chief has an assigned vehicle and there is an additional vehicle that can be assigned to the assistant chief. Two other vehicles are available for the administrative support officers for their standby duty.

The recommendation is to implement the above-described organization and work schedule in its general form with continuous necessary adjustments for a one-year period and then evaluate the results.

REFERENCE LIST

Boudreaux, E., MA, Mandry, C. MD, FACEP, Brantley, P. J., PhD, Jeffries, MA, (1997, March). From 24 to 12; The benefits of shift modification. *JEMS*, 86-87.

Bramell, T. (1997, January). The Livermore Fire Department's new DC's schedule. *American Fire Journal*, 20-22.

City of Fort Scott, Kansas (1999). *1999 Expenditure Report*. Fort Scott, KS: Author.

Cobb, R. (1999, July). D is for difference. *Fire Chief*, 70-73.

Coleman, R. J., & Granito, J. A. (Eds.). (1988). *Managing Fire Services* (2nd ed.). Washington, D. C.: International City Management Association.

Cote, A. E., & Linville, J. L., (Eds.). (1991). *Fire Protection Handbook* (17th ed.). Quincy, MA: National Fire Protection Association.

Fire Service Labor Monthly. (1995, February). Non-traditional work weeks in the fire service. *Fire Service Labor Monthly*, 3-4.

Frazier, G. (1999). *Alternate Work Schedules-Is This the Answer to Increased Efficiency, Safety, and Productivity*? (Executive Development Research Paper). Emmitsburg, MD: National Fire Academy.

Grant, N. K., Ph.D., & Hoover, D. H., Ph.D. (1994). *Fire Service Administration.* Quincy, MA: National Fire Protection Association.

Hill, D. W. (1997). *Call Volume and Shift Scheduling Options for Sioux Falls Fire Rescue*. (Strategic Management of Change Research Paper). Emmitsburg, MD: National Fire Academy.

Maurno, D. A. (1996, February). The pros and cons of the "long haul". *Fire Station Management Advisor*, 6 (2), 1-2.

Mims, L. (1999). *Overtime Cost Reduction with Alternative Work Schedules*. (Executive Leadership Research Paper). Emmitsburg, MD: National Fire Academy.

National Fire Protection Association (1994). *NFPA 1201: Standard for Developing Fire Protection Services for the Public.* (1994 ed.). Quincy, MA: Author.

Paulsgrove, R. (1992a, August). Take this job. *Fire Chief*, 48-53.

Paulsgrove, R. (1992b, September). Take this job and love it. *Fire Chief*, 30-36.

Rule, C. (1997, March). An Alternative to the 24-hour duty day. *American Fire Journal*, 46-47.

APPENDIX
FIRE DEPARTMENT WORK SCHEDULE SURVEY

Please answer the following questions about your fire department:

1. Department Type
   - ☐ Fully Paid
   - ☐ Combination

2. Please check services you provide in addition to fire suppression:
   - ☐ Rescue Services
   - ☐ EMS First Responder Services
   - ☐ EMS Transport Services
   - ☐ Fire Inspections/Fire Code Enforcement
   - ☐ Building Code Enforcement

3. Please fill in the blanks:

   Number of line (shift) personnel _____
   Number of shifts or platoons _____
   Minimum number of on-duty shift personnel _____
   For shift personnel, overtime is paid every:

   - ☐ 14 days
   - ☐ 28 days
   - ☐ Other (Please specify) _____

4. Please fill out the following table:

FULL-TIME POSITIONS	# Persons in Position	SCHEDULE CYCLE (ex:24on24off; 8-5 M-F; etc)	HOURS/WK
Fire Chief			
Asst. Chief			
Battalion Chief			
Captain			
Lieutenant			
Fire Fighter			
Training Officer			
Fire Marshal/Inspector			
Administrative Asst.			
Other (Please specify)			
PART-TIME POSITIONS			
Reserve FFs			
Volunteer FFs			
Other (Please specify)			

5. What was your 1999 annual budget for:

   Full-time Wages _____
   Part-time Wages _____
   Overtime Wages _____

6. What was your 1999 actual (or estimated) expenditures for:

   Full-time Wages _____
   Part-time Wages _____
   Overtime Wages _____

PLEASE RETURN THIS SURVEY BY JANUARY 21, 2000
BY FAX TO: **316.223.8110**
Or by mail to:
Jeff Davis
Fort Scott Fire Department, 1604 S National Ave., Fort Scott, KS 66701

☐ Please check here and write the name of your city if you would like to have a copy of the results of this survey: _____